

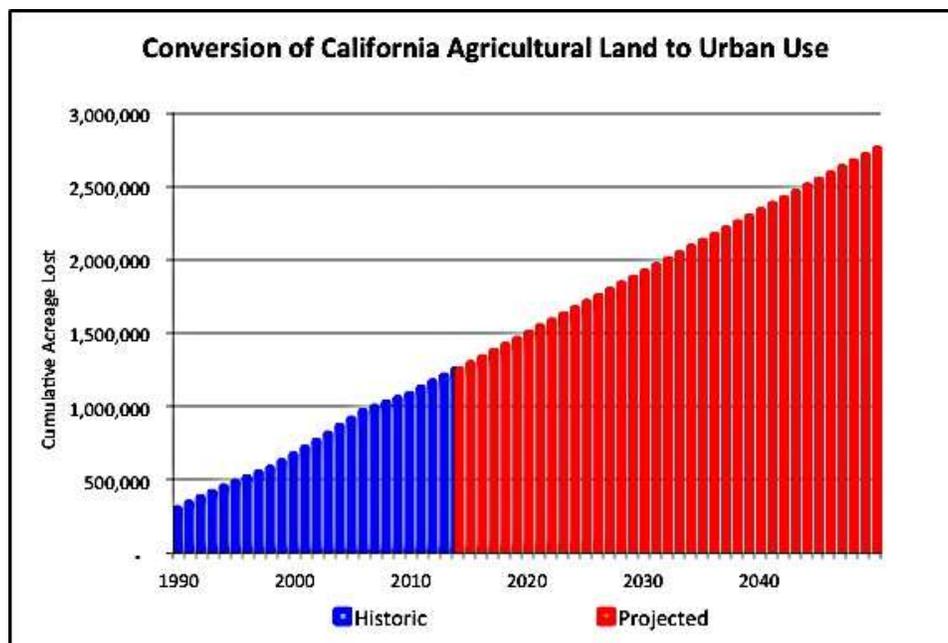
Agricultural Land Conservation as An Important Part of California's Climate Strategy

A White Paper by American Farmland Trust¹
April 2016

A Growing Consensus for Addressing Climate by Conserving Agricultural Land

There is a growing consensus that minimizing the future urbanization of agricultural lands and providing long-term protection for these lands are important, if not essential, to achieving California's greenhouse gas reduction goals².

Since the mid-1980's, an average of nearly 42,000 acres of the state's agricultural land has been converted to urban uses annually, a cumulative total of more than one million acres. If this trend continues, California will lose another 1.4 million acres of agricultural land by 2050.³

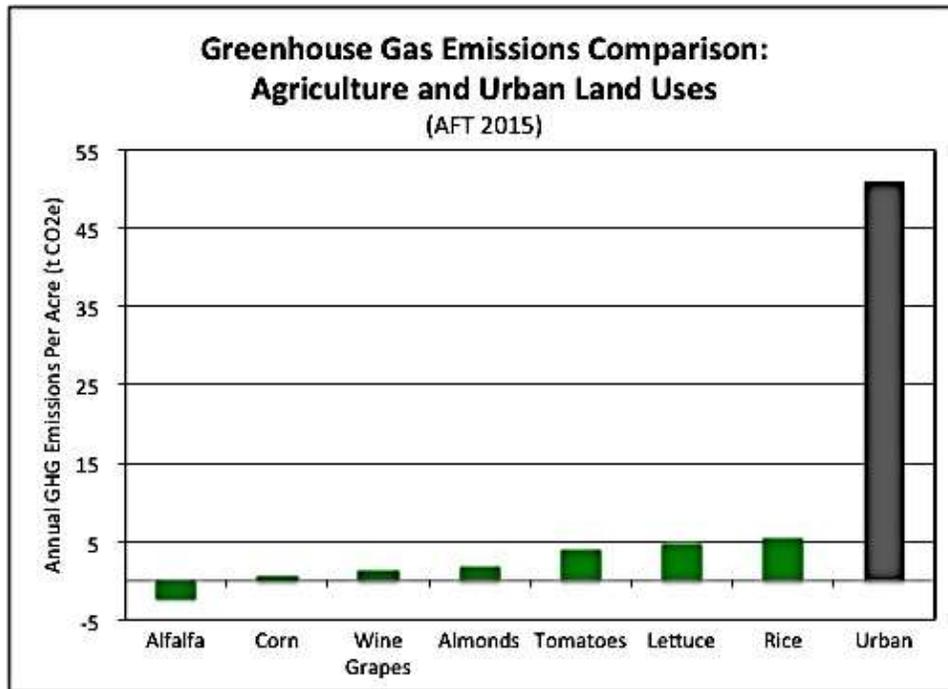


¹ AFT gratefully acknowledges the assistance of Louise Jackson, Stephen Wheeler, Joe DiStefano and Jeanne Merrill in reviewing this paper. The conclusions are solely those of AFT and not necessarily those of the reviewers.

² Governor Brown's Executive Order B-30-15 calls for a reduction in greenhouse gas emissions of 40% below 1990 levels by 2030. This goal has also been incorporated into SB 32 (Pavley) now under consideration by the state legislature.

³ Calculated using data from the Farmland Mapping & Monitoring Program, Division of Land Resource Protection, Department of Conservation, California Natural Resources Agency.

The groundbreaking research done by Professor Louise Jackson and her colleagues at U.C. Davis (2012) was the first to establish a connection between urbanization of farmland and the increase in greenhouse gas emissions. Their work found that in Yolo County greenhouse gas emissions from urban uses were roughly 70 times greater on a per acre basis than those from agricultural operations.⁴ A later study (2015) done for American Farmland Trust reached a similar conclusion after looking at emissions from the state’s leading crops and cities throughout California.⁵



The *First Update to the Climate Change Scoping Plan* (2014) cited Jackson in concluding: “Recent research has shown that GREENHOUSE GAS emissions from urban areas are much greater than those from agricultural lands on a per-acre basis. As California’s population increases, pressures to convert agricultural croplands and rangelands to urban and suburban development also increase. Conservation of these lands will be important in meeting our long-term climate goals.”⁶

Other public and private sector reports have also underscored the importance of conserving farmland. For example, the climate mitigation strategy recently outlined by the state Department of Conservation (2015) in *Safeguarding California*⁷ summed up the

⁴ Louise Jackson, Van R. Haden, et al., *Adaptation Strategies for Agricultural Sustainability in Yolo County, California: A White Paper from the California Energy Commission’s Climate Change Center*, U.C. Davis, July 2012.

⁵ Steve Shaffer and Edward Thompson, Jr., *A New Comparison of Greenhouse Gas Emissions from California Agricultural and Urban Land Uses*, American Farmland Trust, February 2015.

⁶ California Air Resources Board, *First Update to the Climate Change Scoping Plan*, May 2014, at 59.

⁷ *Safeguarding California: Implementation Action Plans*, Agricultural Sector Plan, California Natural Resources Agency, March 2016, at 24. This report also includes a vivid and comprehensive description of the risks that climate change poses to California agriculture.

synergistic effect that farmland conservation could have in mitigation climate change: “Reducing the rate of farmland conversion will buffer against climate risks by supporting smart growth, reducing unsustainable sprawl, and promoting sustainable food systems and ecosystems. Farmland conservation is a critical component of ensuring food security. Since California Farmland is so unique, it will be imperative for California to have sufficient farmland in the right locations to allow for food production and flexibility as impacts of climate change become more severe.”

A recent analysis of statewide land use patterns and future options by Calthorpe Analytics and Energy Innovations found that “implementation of smart land use policy, in combination with technological advances in the energy sector, will be critical for the state to achieve its ambitious 2030 de-carbonization target. The [more efficient] land use patterns studied here could lead to even larger carbon emissions reductions than estimated because they will also preserve more land in California for carbon sequestration.”⁸

Perhaps most significantly, a study published by the Duke Nicholas School for Environmental Policy Solutions (2014) compared the greenhouse reduction potential of various agricultural practices documented in the scientific literature, concluding that: “Because average GREENHOUSE GAS emissions from urban land uses are orders of magnitude higher than those from California croplands (approximately 70 times higher per unit area), farmland preservation, more than any of the other management activities, will likely have the single greatest impact in stabilizing and reducing future emissions across multiple land use categories.”⁹

Estimating Potential Greenhouse Gas Avoidance from Farmland Conservation

To estimate the potential of farmland conservation to contribute to the avoidance and/or reduction of greenhouse gas emissions, we made some calculations based on existing sources of data and what we believe to be conservative assumptions.

We used data on greenhouse gas emissions from the Jackson study (Appendix, Table 2) to calculate that emissions from urban land uses average 60.7 tons per acre per year greater than those from crop production, and 61.2 tons per acre per year greater than those from rangeland. However, the conversion of cropland or rangeland to urban use does not necessarily increase greenhouse gas emissions by these amounts; nor does preventing such conversion result in comparable emissions savings. This is because preventing the conversion of agricultural land to urban use does not – and should not – prevent the economic activity that would have occurred on that land. It must go somewhere and, given the traditional pattern of city-centered development in California,

⁸ Chris Busch, Erika Lew and Joe DiStefano, Calthorpe Analytics and Energy Innovation Policy & Technology, LLC, *Moving California Forward: How Smart Growth Can Help California Reach Its 2030 Climate Target While Creating Economic and Environmental Co-Benefits, Summary for Policymakers*, Sep. 2015, at 1.

⁹ Steven W. Culman, Van R. Haden, Toby Maxwell, Hannah Waterhouse and William Horwath. *Greenhouse Gas Mitigation Opportunities in California Agriculture: Review of California Cropland Emissions and Mitigation Potential*. Duke University, 2014, at 35.

and the fact that most cities in agricultural areas are surrounded by farmland, it is likely to occur on urban edge farmland but at higher densities, thus resulting in the conversion of less agricultural land.

Because greenhouse gas emissions from urban land uses are known to vary with the density of development, the concentration of economic activity will influence what percentage of the difference between urban emissions and those from cropland and rangeland will actually be avoided. To estimate this percentage, we used data provided by Calthorpe Analytics on average population densities and per acre GREENHOUSE GAS emissions from various types of urban land uses in California: high-density urban, compact urban-suburban and standard suburban development. (Appendix, Table 3) We compared the emissions from development spread out over agricultural land at standard suburban densities to emissions from a scenario in which a comparable population was accommodated in a mix of 10% high-density urban-suburban and 90% compact urban-suburban patterns. Based on these assumptions, we calculated that the more compact scenario would reduce GREENHOUSE GAS from the same population by about 55 percent. This percentage was then applied to the GREENHOUSE GAS differential figures from the Jackson study to conclude that saving an acre of cropland would avoid an average of 33.24 t CO₂e per acre per year, while saving an acre of rangeland would save 33.51 t CO₂e per acre per year.

We then used these averages to compare the greenhouse gas implications of two statewide farmland conversion scenarios. The first was an extension of the status quo trend (Appendix, Table 4) out to the year 2050. The second was based on the goals of reducing statewide farmland conversion by 50% compared with the current trend by the year 2030 and further reducing it by 75% by the year 2050. (Appendix, Table 1) In the second scenario, we assumed that 74% of the agricultural land saved would be cropland and 26% would be rangeland, reflecting the historic statewide conversion trend. We further assumed that the conversion rate would steadily and consistently decline from year to year until the goals were reached. To calculate the cumulative greenhouse gas emissions avoided, we assumed that the annual emissions avoided by preventing the conversion of agricultural land would continue to accrue each year from the date that the land was saved from conversion (and further assuming, of course, that it would not be developed). Hence, farmland conversion avoided in 2015 would accrue GREENHOUSE GAS benefits for 35 years, out to the year 2050. The year-to-year calculations are shown in Table 1 of the Appendix, while a summary is provided in the table below.

Comparison of Agricultural Land Conversion Scenarios 2015-2050

Scenario	Acres Developed	Cumulative GREENHOUSE GAS Emissions (t CO ₂ e)
Current Trend	1,459,500	575,480,086
50%-75% Reduction Goal	766,238	260,288,381
Savings by Meeting Goal	693,263	315,191,705

The greenhouse gas savings that would be achieved by meeting the foregoing farmland conversion avoidance goals would be comparable to eliminating about 767 billion vehicle miles travelled or taking 1.9 million cars off the road every year between now and 2050.¹⁰ (Appendix, Table 5)

Strategies to Achieve Avoided Farmland Conversion Goal

American Farmland Trust respectfully suggests that the foregoing analysis be the starting point for establishing a definitive statewide goal of reducing the annual rate of agricultural land conversion as a means of avoiding an unnecessary and avoidable increase in greenhouse gas emissions. This is consistent with the recommendation of the First Update of the Climate Scoping Plan: [The state should] “establish agriculture sector GREENHOUSE GAS emission reduction planning targets for the mid-term time frame and 2050.”

The Governor’s November 2015 Environmental Goals and Policy Report¹¹ also endorsed this step: “We need to set development goals that are compatible with the State’s long-term climate change goals established by the State’s five pillars for the future. These development goals are to:

- Reduce land consumed for development 50 percent relative to today’s trend by 2050
- Reduce vehicle miles traveled per capita at least 15 percent by 2020 and 25% by 2040
- Prioritize the conservation of high quality agricultural land, including rangelands.”

This paper suggests that the goal for reducing the rate conversion of agricultural land to urban use should be more ambitious than what the EGPR suggests, including a 50% reduction by 2030 and a 75% reduction by 2050. While this would save nearly 700,000 acres, it would still result in the conversion of more than three-quarters of a million acres of California agricultural land by mid-century. The impact of such a loss on California agriculture, not to mention on our climate, will be substantial. For comparison, the fallowing of about 500,000 acres of farmland due to drought resulted in a \$2.7 billion loss to agriculture and the state’s economy in 2015.¹² This underscores the need for an ambitious and targeted goal for avoiding the urbanization of farmland that will take into effect the impacts of climate change, including the prospect that additional farmland will be no longer be suitable for agricultural use. The relative productivity, vulnerability and resiliency of agricultural land should be considered in translating a statewide goal into regional and perhaps even local goals in the most important agricultural areas of the state.

Achieving regional and local goals to reduce the rate of farmland conversion in California will require a determined, concerted and creative effort by state agencies and

¹⁰ *Greenhouse Gas Emissions from a Typical Passenger Vehicle*, U.S. Environmental Protection Agency, Office of Transportation and Air Quality, May 2014.

¹¹ Office of Planning & Research, *A Strategy for California @ 50 Million: Supporting California’s Climate Change Goals*, November 2015, at 2.

¹² R.A. Howlett, et al., *Economic Analysis of the 2105 Drought for California Agriculture*, U.C. Davis, August 2015.

local governments as well as the open-minded cooperation of developers and landowners. Despite all the statutes and ordinances now on the books and the tens of millions of dollars that have been spent on land use planning, tax incentives and easement acquisition, the annual statewide rate of farmland conversion in has not appreciably declined since records were first kept more than three decades ago.

On the other hand, there seems to be growing interest in increasing urban and suburban densities, which would result in the consumption of less land – mostly agricultural land – for each new person, job and dollar of economic activity. Some of the reasons behind this are the rising cost of land, a shift in demographics and the housing market, and a growing recognition that low-density urban sprawl has many unnecessary public costs – among them, of course, excessive greenhouse gas emissions – that local governments and taxpayers are increasingly hard-pressed to afford. Harnessing this trend by promote more urban infill and compact, affordable suburban housing is a promising strategy for conserving farmland. But it must be accompanied by an equally robust, affirmative effort to prevent unnecessary development of agricultural land and, ideally, to provide permanent protection of the best land at the greatest risk.¹³

A number of local communities in California have effectively reduced or practically eliminated farmland conversion – and have done so while enjoying continued economic growth. Counties like Marin, Monterey, Napa, Sonoma, Ventura and Yolo – which together accounted for nearly 20% of the state’s agricultural output in 2012 – are among the nation’s leaders in farmland conservation. Most of them combine effective infill and urban growth management policies with robust agricultural easement acquisition efforts to prevent sprawl, offer long-term protection to agricultural land and spread the cost among landowners and the general public.¹⁴ These communities demonstrate not only that it is possible to conserve a significant amount of farmland in California, but also how to do it.

There is much that the state could do using existing authorities and policies to encourage more local communities to embrace the kind of strategies that have proved effective at conserving farmland. It could begin by implementing a recommendation of the First Update of the Climate Change Scoping Plan, namely:

“Local and regional land use planning actions and policies need to more fully integrate and emphasize land conservation and avoided conversion of croplands, forests, rangelands, and wetlands. The California Natural Resources Agency, the California Environmental Protection Agency, CDFG, and ARB will convene an inter-agency workgroup to engage local and regional land use planning agencies in establishing a coordinated local land use program to develop recommendations and

¹³ See, Wheeler, S.M., M. Tomuta, V.R. Haden, and L.E. Jackson, *The Impacts of Alternative Patterns of Urbanization on Greenhouse Gas Emissions in an Agricultural County*, Journal of Urbanism: International Research on Placemaking and Urban Sustainability, 2013.

¹⁴ For details about how these programs work see, Edward Thompson, Jr., *Hybrid Farmland Protection Programs: A New Paradigm for Growth Management*, 23 William & Mary Environmental Law and Policy Review 831 (1999).

targets for incorporating farmland conservation in local and regional land use planning.”¹⁵

The state could and should also take a close look at existing state policies and programs that are designed to reduce the conversion of farmland to urban use and propose improvements in implementation or the statutory authorities themselves that would make them more effective. The following are examples of changes in state policies and programs that should be considered:

Williamson Act – Increase tax incentives for enrollment of urban edge agricultural lands at risk of conversion. Link eligibility for those tax incentives to effective local land conservation policies as well as to landowner contracts.

Cortese-Knox-Hertzberg Act – Require a stronger showing of genuine need for LAFCO approval of expansion of spheres of influence and city limits. Require farmland mitigation as a condition of annexation. Extend these policies to development in unincorporated areas that could influence orderly urban growth.

California Environmental Quality Act – Require mitigation of all farmland conversion by avoiding the highest quality farmland, minimizing its conversion through higher densities and offsetting any unavoidable losses through easement acquisition.

AB 857 – Harness state investments in local infrastructure to the state planning priorities enumerated in this law: infill, efficient development, conservation of farmland and open space. Give priority to communities that have plans that will achieve farmland conservation-related greenhouse gas reduction goals.

SB 375 – Incorporate a land conservation element with explicit goals for reducing farmland conversion into Sustainable Communities Strategies.

California Farmland Conservancy Program – Increase funding, possibly combine with SALCP.

Sustainable Agricultural Land Conservation Program – Increase funding to at least \$100 million per year. Allow more flexibility to fund acquisition of easements in areas formally designated as agricultural conservation areas to avoid their development.

Conclusion

As many leading authorities have suggested, the Natural and Working Lands pillar of California’s climate strategy should include an aggressive effort to reduce the conversion of agricultural land to urban uses. This effort should be guided by an ambitious but achievable goal of reducing the annual rate of farmland conversion at least 50 percent by

¹⁵ *Id.*, at 61.

2030 and at least 75 percent by 2050. This would result in substantial greenhouse gas savings over time as well as maintain the land base on which carbon sequestration and additional emissions reductions can be achieved through improved agricultural management practices. In pursuit of this goal, state policies and investments should be harnessed to encourage local communities in the state's most important agricultural areas to follow the lead of those who have already achieved great success in reducing farmland conversion.

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American Farmland Trust is a national, nonprofit conservation organization established in 1980 to conserve agricultural lands, promote environmentally beneficial agricultural practices and help keep farmers and ranchers on the land. AFT works collaboratively with government and private partners to design creative solutions to resource conservation challenges and champions public policies that will effectively implement those solutions. For more information, please see: www.farmland.org.